

10th Anniversary
Kansas Wind & Renewable Energy
Conference '09

CHALLENGE OF ETHANOL

October 6 & 7, 2009

Ramada Inn

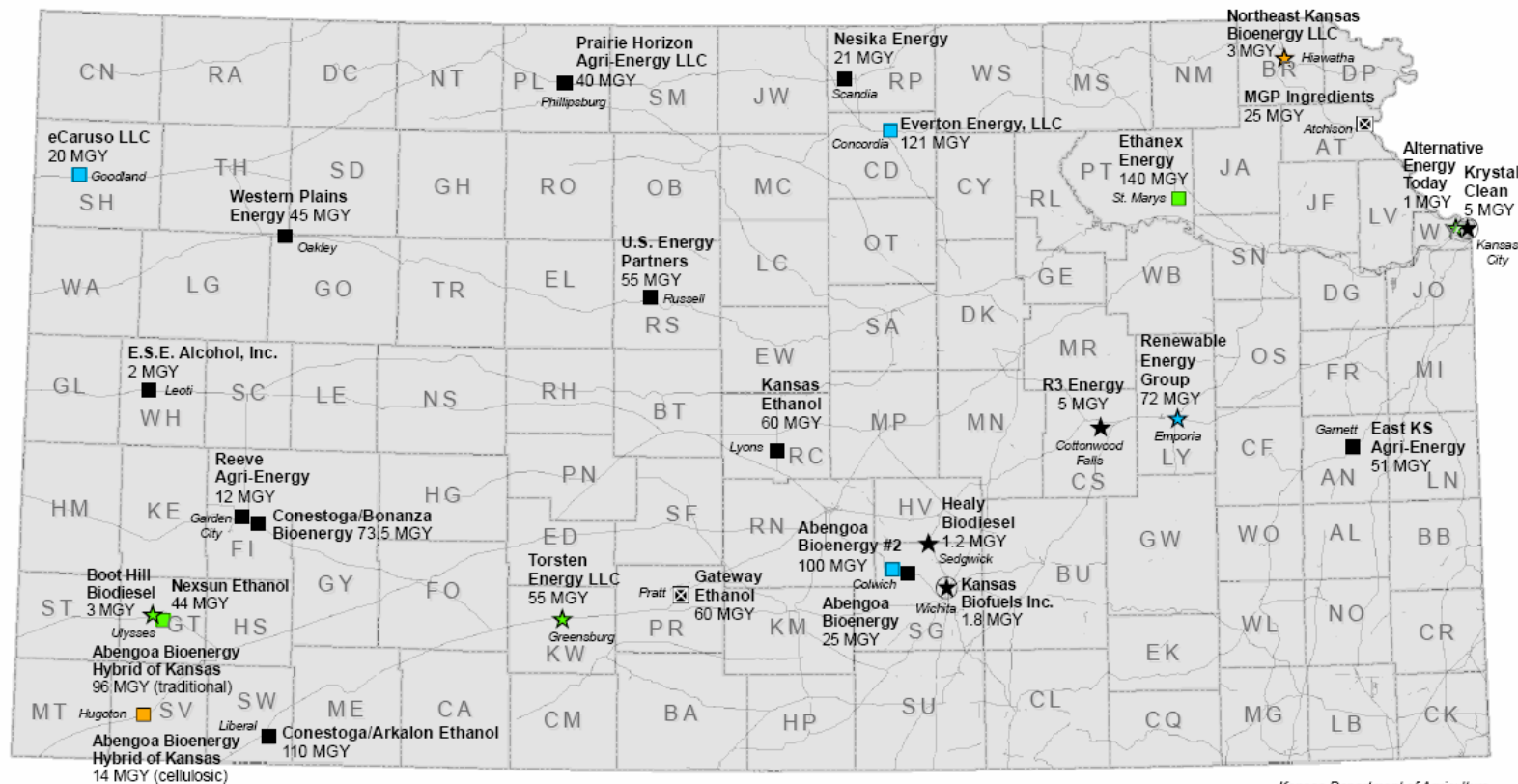
Topeka, Kansas

WHERE WE ARE:



- Biorefineries in production – 179
- Biorefineries under construction – 12
- Idle – 22
- 11 BB +- mgy capacity
- *Source: Renewable Fuels Association, 10.09*

Ethanol and Biodiesel Plant Activity in Kansas August 2009



Kansas Department of Agriculture
Administrative Services, GIS
August 10, 2009



MGY = Millions of gallons per year of permitted capacity.
Capacities courtesy of Kansas Department of Health and
Environment and the Kansas Department of Revenue.

* Permitted and Permit Pending codes refer to KDHE Bureau of
Air and Radiation – Air Construction permits.



- A little more than half of the gasoline in the United States has some amount of ethanol blended into it
(Energy Information Administration (part of the DOE) – April 29, 2009)
- Stabilizing after commodity shocks, over building
 - Commodity risk management
 - Insufficient capital

- Industry Bankruptcies – still more small projects to come
- Declining Asset Values
 - Post-BK plants have low debt ratios
 - Plants that survived will need to recap high debt levels
- Oil Company entry into industry (as long predicted)
 - Murphy Oil Corporation – corn-based 110 mgy ethanol plant located in Hankinson, North Dakota
 - \$92 million Seller-provided non-recourse debt, \$15 million in working capital

- According to RFA, from 2001–2006
 - Water consumption at ethanol biorefineries decreased 26.6%
 - Ethanol production used 15.7% less electricity
 - Production saw a total decrease in energy use by 21.8%.

- NEAR TERM FUTURE

- Financial Outlook

- Lower corn prices relative to prior two years
 - Oil/ethanol prices up from recessionary low

- Energy Policy and Incentives

- Direct subsidies

- October 2 GAO Report:

- » 45-Cent-per-gallon federal tax credit expensive, no longer needed to stimulate the production of corn-based fuel
 - » Mandate levels can be met without subsidy
 - » Focus subsidies on next generation biofuels

- Tax subsidies for oil, gas and coal
 - Environmental Law Institute (ELI)/ Woodrow Wilson International Center for Scholars
 - Reviewed fossil fuel and energy subsidies for Fiscal Years 2002–2008
 - Lion's share of energy subsidies supported energy sources that emit high levels of greenhouse gases
 - Larger subsidies to fossil fuels than to renewables
 - Fossil fuels \$72 billion over the seven year period
 - Renewable fuels totaled only \$29 billion
 - Only \$16.8 billion attributable to corn-based ethanol

- RFS2

- Renewable fuel mandate increases from 7.5 billion gallons by 2012 to 36 billion gallons by 2022
- In order to generate renewable identification numbers (RINs) to meet these mandates, renewable fuels must meet certain baseline carbon reduction thresholds and must be manufactured from feedstock meeting the definition of renewable biomass

Renewable Fuel Volume Requirements for RFS2 (billion gallons)

Year	Cellulosic biofuel requirement	Biomass-based diesel requirement	Advanced biofuel requirement	Total renewable fuel requirement
2008	n/a	n/a	n/a	9.0
2009	n/a	0.5	0.6	11.1
2010	0.1	0.65	0.95	12.95
2011	0.25	0.80	1.35	13.95
2012	0.5	1.0	2.0	15.2
2013	1.0	a	2.75	16.55
2014	1.75	a	3.75	18.15
2015	3.0	a	5.5	20.5
2016	4.25	a	7.25	22.25

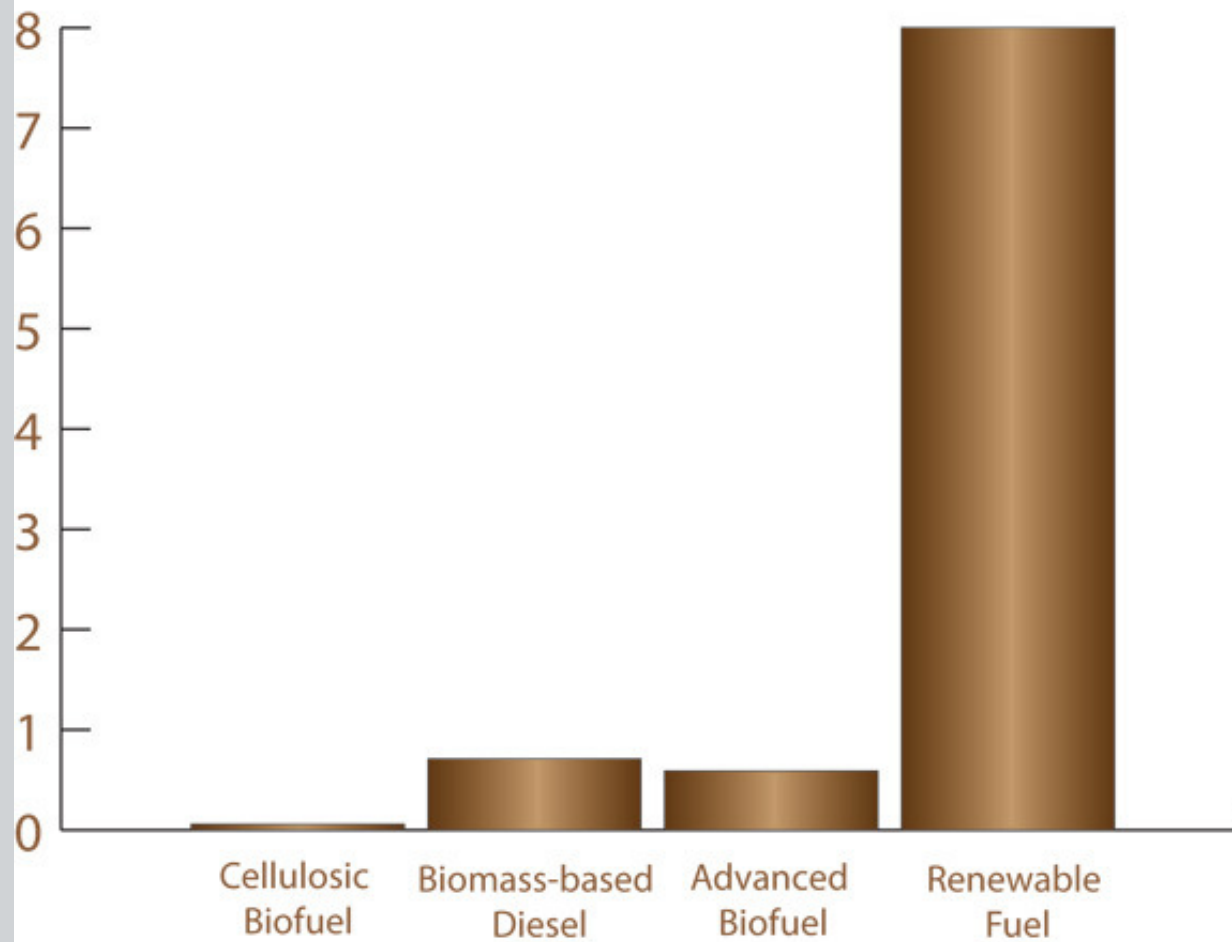
a To be determined by EPA through a future rulemaking, but no less than 1.0 billion gallons.

b To be determined by EPA through a future rulemaking.

Source: **EPA-420-F-09-023, May 2009**

Proposed Standards for 2010

(shown as a fraction of a refiner's or importer's gasoline and diesel volume that must be renewable fuel)



*Data sourced from page 4 of EPA Fact Sheet: EPA Proposes New Regulations for the National Renewable Fuel Standard Program for 2010 and Beyond

- Four unique categories of renewable fuel, each with its own respective mandate
 - Cellulosic biofuel is defined as any renewable fuel – not necessarily ethanol – that is derived from cellulose, hemicelluloses or lignin
 - GHG emission–reduction threshold of 60 percent
 - Advanced biofuel is defined as a renewable fuel other than ethanol derived from cornstarch (biomass–based diesel, biogas, butanol or other alcohols and fuels derived from cellulosic biomass)
 - GHG emission–reduction threshold of 50 percent
 - Biomass–based diesel
 - GHG emission–reduction threshold of 50 percent

- Additional fuel used to meet the total renewable fuel mandate is required to meet a 20 percent GHG-reduction threshold – majority of this is expected to be corn-based ethanol
 - Corn-based ethanol plants will be required to meet this reduction threshold in order to generate RINs
 - But proposed rule includes a component that allows many existing plants to be grandfathered
 - While participation of corn-based ethanol in the RFS2 limited to 15 billion gallons, there is not a mandated volume
- Excess RINs from cellulosic biofuel, biomass-based diesel and advanced biofuel can be used to meet total renewable fuel mandates in place of corn-ethanol

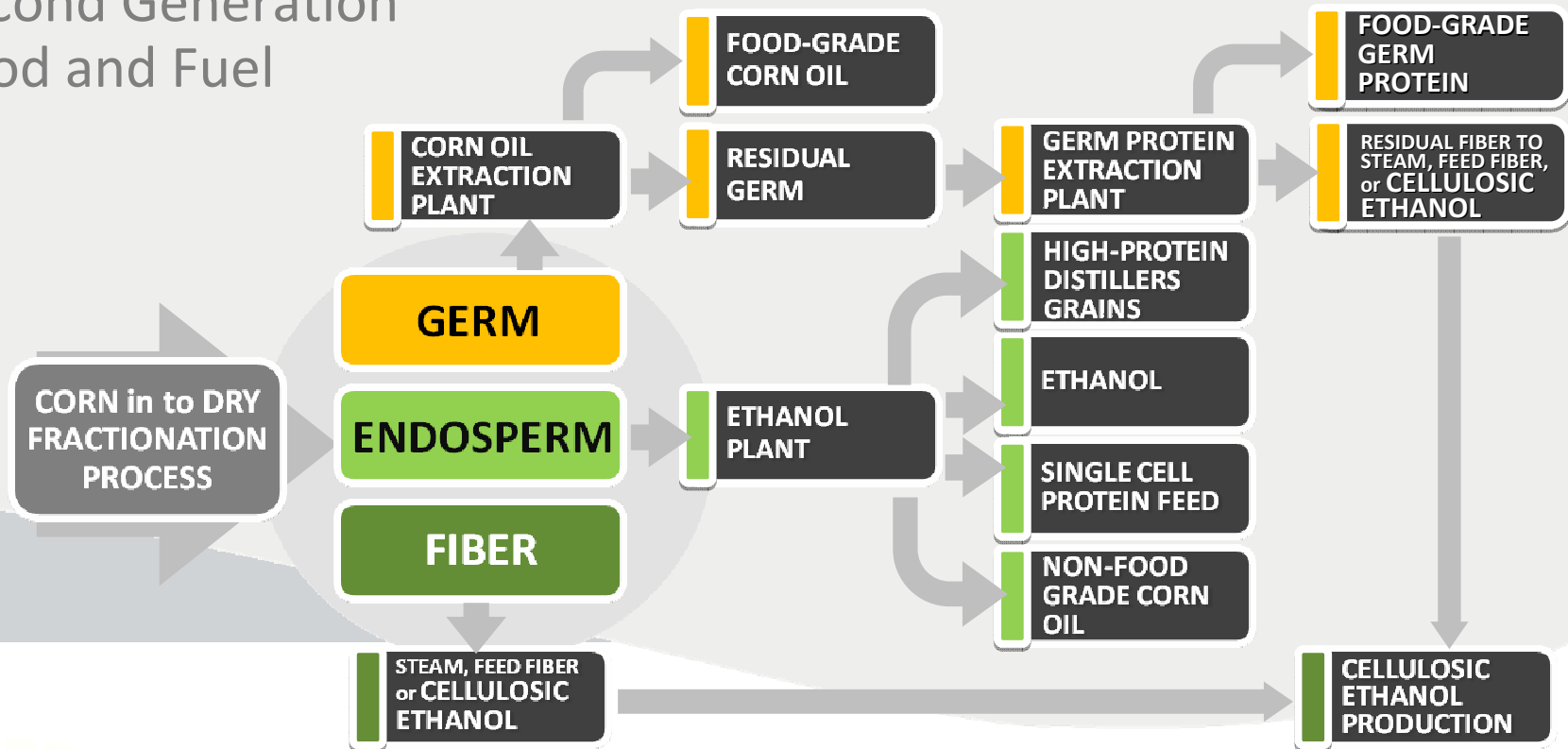
- Blending levels -- raising the 10% blend limit
 - In most states, penetration far below 10%
- Expectation of some increase -- 12% as next step?
- Cap and trade?
 - Not this year!

- Technology improvements -- Corn Based Projects
 - Energy reduction/efficiency
 - Cellencor -- Industrial microwave technology
 - Replacing old technology natural gas and steam tube dryers with highly efficient, reliable industrial microwave systems
 - Enhancing the market value of DDGS by increasing its nutritional value
 - Microwave demulsification of condensed distiller's solubles
 - » Enhance, by 30–50%, extraction efficiency of corn oil recovery

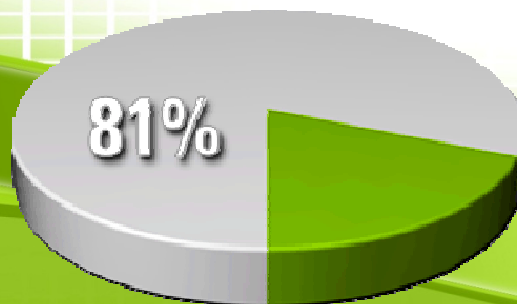
- Technology improvements -- Corn Based Projects
 - Other corn oil extraction technology improvements
 - Other co-products
 - Biomass as heat source for current natural gas-fired plants

TKO - Total Kernel Optimization

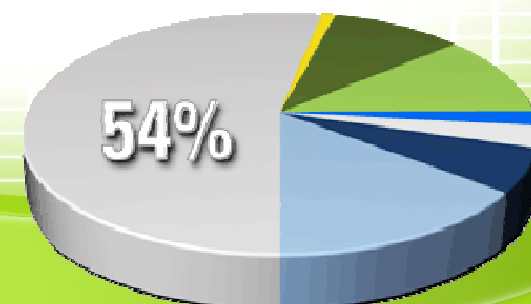
Second Generation
Food and Fuel



Standard Plant Ethanol Revenue



TKO Plant Ethanol Revenue



- Advanced biofuels
 - Biobutanol -- a four-carbon alcohol similar to ethanol
 - Produced on industrial scale since World War I – high production costs have prohibited widespread use
 - Blended with gasoline, biobutanol's molecular structure prevents it from readily absorbing water – biobutanol can be transported in existing pipeline infrastructure
 - Current fuel ethanol technology is compatible with producing biobutanol
 - Fermentation of current ethanol feedstocks, and future cellulose feedstocks—with slight changes in distillation—will produce butanol

- Butamax, a joint venture of [BP](#) PLC and DuPont Co -- Pilot plant in England
- Colorado-based Gevo Inc.
 - A three-part technology package for retrofitting existing ethanol plants to produce biobased isobutanol
 - Colorado and Missouri pilots -- partnering with ICM

- Algae
 - XOM \$600MM joint venture
 - GPRE Pilot
 - Green Plains Renewable Energy, Inc -- BioProcessAlgae LLC – Iowa Office of Energy Independence -- Iowa Power Fund – Algae pilot project at Green Plains’ ethanol plant in Shenandoah, Iowa
 - Algae -- potential carbon sequestration solution, biofuel feedstock and feed product
 - One of the first operational installations of a photobioreactor system at an industrial plant in the United States
 - Source: Green Plains Renewable Energy, Inc. – www.gpreinc.com

- Joule Biotechnologies "SolarConverter"
 - Engineered organisms live inside a panel, filled with recycled non-potable water
 - CO₂ and sunlight are pumped in
 - Organisms photosynthesize and directly secrete usable fuel products

DISCUSSION

Energy Law is in Our NatureSM

Husch Blackwell Sanders has one of the largest and oldest energy law practices in the Midwest.
Our attorneys have renewable energy experience on projects that have produced:



1,500 megawatts
under development
in regional wind &
solar projects



1 billion gallons
in annual biofuel
production



1 million MMBtu
in landfill gas
production

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For more information, contact energylaw@huschblackwell.com or visit www.huschblackwell.com/energylaw

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Husch Blackwell Sanders is a full-service litigation and business services law firm with a client base of domestic, international and multinational corporations. We offer national-level competitive practices with superior client service for compelling value to leading companies. Our clients include national or global leaders in major industries including agribusiness, energy, financial services, healthcare, litigation practices, particularly in the areas of mergers and acquisitions, securities, tax, insolvency and commercial bankruptcy, business litigation, intellectual property, environmental, labor and employment and real estate.

We have grown to more than 625 lawyers with offices in 14 cities, in Kansas City, St. Louis, Springfield and Jefferson City, Missouri; Omaha and Lincoln, Nebraska; Chattanooga and Memphis, Tennessee; Chicago and Peoria, Illinois; Phoenix, Arizona; Denver, Colorado; Washington, D.C., and London, U.K.

Husch Blackwell Sanders

Husch Blackwell Sanders is a recognized leader in renewable energy and biofuels. Our attorneys have broad experience in all aspects of the development, financing, operation, and purchase and sale of renewable energy and biofuels assets, including experience in the ethanol, biodiesel, wind, landfill gas, biomass and other renewable energy sectors. With a wealth of experience, our Renewable Energy and Biofuels team delivers world-class, cost-effective legal services to the renewable energy and biofuels industries. We represent developers, investors, owners, and lenders in connection with projects at all stages, from investment and tax structuring, through development, construction, financing, and operations. We also draw on our historical experience in the energy industry in representing our renewable energy and biofuels clients with respect to strategic transactions and litigation.

David E. Gardels

An experienced deal lawyer with Husch Blackwell Sanders LLP law firm, David Gardels focuses his practice primarily on finance and lending, mergers and acquisitions, and venture capital transactions. He is a member of the firm's renewable energy practice and represents investment bankers, developers and owners of renewable energy in all phases of project development and finance. David has worked on ethanol projects with a combined capacity of over 1 billion gallons per year, and is the team leader for a public ethanol entity that is a joint venture with a major world agribusiness and is co-located with an electric generation facility. He is involved in numerous other renewable energy matters, including biodiesel and innovative new technology development. David is counsel to the National Renewable Energy Investment Fund, Inc., a fund being organized to invest in the renewable energy sector. In addition to representing wind developers and land owners, David was appointed to the advisory committee and a technical committee for the Nebraska Unicameral's current comprehensive study of wind development.

Throughout his 25-year career as a corporate finance attorney, David has guided public and private companies in capital planning and in meeting rapidly evolving corporate governance requirements. He represents borrowers and lenders in substantial lending and structured finance transactions, as well as a number of high-growth corporations in planning, financing and implementing growth plans. David also has a substantial investment services practice, and represents public and private investment funds, including both open and closed-end investment company complexes. He currently serves as President of the Rocky Mountain Chapter of the Society of Corporate Secretaries and Governance Professionals.

CONTACT INFORMATION:

**David E. Gardels
Husch Blackwell Sanders LLP
1620 Dodge Street, Ste. 2100
Omaha, NE 68102
Phone: 402.964.5000
Fax: 402.964.5050
david.gardels@huschblackwell.com**